not be very many now left who can say as much, so I hope I may be allowed to add my voice to the chorus of congratulation which I am sure will greet the completion of its first half-century. Others may be better qualified to testify to the value of its services to various branches of science, but nobody can be more appreciative of the help it has given to the progress of science generally, especially in this country, which is fortunate in possessing what is admittedly the leading scientific newspaper in the world. The thanks of all associated with scientific matters are due alike to its eminent founder, still happily amongst us, and to the publishers who cooperated with him in what at the time can scarcely have been regarded as a very promising speculation.

DR. HENRY WOODWARD, F.R.S.—Having been present at a dinner at the Garrick Club in 1869 to inaugurate the birth of NATURE, now in its fiftieth year, I feel proud to be permitted to offer by hearty congratulations to the Editor and the publishers upon this memorable occasion of its jubilee. It is no small undertaking to have produced more than 2600 weekly numbers of a journal embracing every branch of natural knowledge during half a century. Long may NATURE flourish, and long may the founder be spared to see its prosperity and, with the eminent firm of Macmillan, enjoy its cosmopolitan honours and high scientific reputation.

NOTES.

THE KING has been pleased to approve of the following awards this year by the president and council of the Royal Society:—Royal medal to Prof. J. B. Farmer for his notable work on plant and animal cytology, and Royal medal to Mr. J. H. Jeans for his researches in applied mathematics. The following awards have also been made by the president and council:—Copley medal to Prof. W. M. Bayliss for his contributions to general physiology and to biophysics; Davy medal to Prof. P. F. Frankland for his distinguished work in chemistry, especially that on optical activity and on fermentation; Sylvester medal to Major P. A. MacMahon for his researches in pure mathematics, especially in connection with the partition of numbers and analysis; and Hughes medal to Dr. C. Chree for his researches on terrestrial magnetism. The following is a list of those recommended by the president and council of the Royal Society for election to the council at the anniversary meeting on December 1:—*President:* Sir J. J. Thomson, O.M. *Treasurer:* Sir David Prain, C.M.G. *Secretaries:* Mr. W. B. Hardy and Mr. J. H. Jeans. *Foreign Secretary:* Prof. W. A. Herdman. *Other Members of the Council:* Mr. J. Barcroft, Mr. C. V. Boys, Sir J. J. Dobbie, Sir F. Dyson, Prof. J. B. Farmer, Sir W. M. Fletcher, K.B.E., Prof. F. W. Gamble, Sir R. T. Glazebrook, Prof. J. W. Gregory, Dr. A. C. Haddon, Sir R. A. Hadfield, Bart., Sir A. B. Kempe, Sir W. J. Pope, K.B.E., Dr. S. H. C. Martin, Prof. A. Schuster, and Prof. W. P. Wynne.

THE President of the French Republic, accompanied by Mme. Poincaré, received a cordial welcome upon his arrival in London on Monday, on a visit to the King and Queen. British men of science would wish to convey to President Poincaré the expression of their high regard for the influence France has always exerted in the cause of science and civilisation in Europe, and of fraternal greetings to the eminent leaders in intellectual activity who are preserving this great heritage. A banquet in honour of President and Mme. Poincaré was given by the King and Queen at Buckingham Palace on Monday evening. On Tuesday the President, accompanied by Mme. Poincaré, visited the City and were presented with an address by the Lord Mayor. To-day the President is to be installed as Lord Rector of Glasgow University, and, with Mme. Poincaré, will be entertained at luncheon at the University, after which he is to be presented with the freedom of the city.

A CORRESPONDENT informs us that the Village Club at Wimbledon, wherein, as Sir Norman Lockyer explained in our jubilee number, the idea of NATURE was born, was founded by Dr. Joseph Toynbee (father of Arnold Toynbee), and one of his intentions was to have a local museum in the building. Such a museum is now there, brought together by the more recently established John Evelyn Club for Wimbledon. The Village Club premises were occupied by the military during the war, but the collections have now been replaced and are again open to the public. They include prints, pictures, maps, and a photographic survey, as well as many antiquities, bygones, and natural history specimens, all connected with the locality. It is hoped that the portrait of Sir Norman Lockyer will soon adorn the walls of the museum.

SIR E. RAY LANKESTER has just completed fifty years' editorship of the *Quarterly Journal of Microscopical Science,* and the current issue of that well-known periodical (vol. lxiv., part 1) contains a brief summary by Prof. G. C. Bourne of the contents of the journal for the last half-century, demonstrating very clearly the important part that it has played in the development of modern biological science. We offer our hearty congratulations to Sir Ray Lankester on this notable occasion, and hope that many more volumes may appear under his distinguished editorship.

IN reply to a question by Sir Philip Magnus, Mr. Bonar Law has announced that the Commissioners to be appointed under the Forestry Acts are as follows:—Lord Lovat (chairman), Director of Forestry, B.E.F., France, and member of Forestry Reconstruction Sub-Committee and of the Interim Forest Authority; Mr. F. D. Acland, M.P., chairman of the Home-grown Timber Committee, chairman of the Forestry Reconstruction Sub-Committee, and chairman of the Interim Forest Authority; Lord Clinton, formerly president of the Royal English Arboricultural Society and member of the Interim Forest Authority; Mr. L. Forestier-Walker, M.P.; Sir John Stirling-Maxwell (hon. secretary), formerly president of the Royal Scottish Arboricultural Society and member of the Forestry Reconstruction Sub-Committee; Mr. T. B. Ponsonby, member of the Interim Forest Authority; Mr. R. L. Robinson, member of the Interim Forest Authority, secretary of the Forestry Reconstruction Sub-Committee, and formerly head of the Joint Forestry Branches of the Board of Agriculture and Office of Woods; and Col. W. T. Steuart-Fotheringham, member of the Interim Forest Authority.

AFTER a successful military campaign the House of Commons has frequently voted large sums of money from public funds to the commanders under whose guidance the conquest was won. National recognition of a like kind was given to Jenner by a grant of 10,000*l.* made by the House in 1802, and by a further grant of 20,000*l.* five years later, the intervening period having strengthened the opinion as to the efficacy of vaccination and its great benefits to the nation at large. Sir Ronald Ross has long urged that this principle should be commonly followed in connection with great discoveries by which numerous human lives are saved, as it is as the result of military conquests. In the case of a medical man devotion to research means the sacrifice of private practice, and when the result of his work is to the great advantage of the human race at large, or the nation in particular, much can be said in favour of just compensation to him. To further this reasonable claim for awards for medical discovery, a joint committee of the British Medical Association and the British Science Guild has just been formed. Sir Ronald Ross entertained the members of the committee to luncheon on November 4, and among those present were Prof. W. M. Bayliss, Sir Alfred Keogh, G.C.B., Dr. R. T. Leiper, Prof. B. Moore, Col. Nathan Raw, M.P., and Dr. W. Somerville. At a meeting held on the same day it was decided that each of the members of the committee should collect information regarding medical research work and discovery already carried out which he considers worthy of recompense by the Government or other bodies, and Sir Ronald Ross undertook to collate and edit the information in a report to the committee for further action.

IN June, 1917, the Fuel Research Board was asked by the Board of Trade and other Government Departments concerned to advise as to the most suitable composition and quality of gas. In January last the Board made its report, and this has since been the basis of negotiations between representatives of the Board of Trade, gas companies, and local authorities. An agreement has now been reached, and from a recent statement by Sir A. Geddes, in reply to a question in the House of Commons, a Bill will shortly be introduced to give effect to the recommendations of the Fuel Research Board as modified by the agreement now arrived at. The gas consumer will be charged for the potential thermal units supplied to him, the unit to be 100,000 British thermal units. The gas companies are to declare the calorific value of the gas they propose to supply, no fixed standard being laid down by Parliament. The British thermal units supplied are to be calculated by multiplying the number of cubic feet registered by the consumer's meter by the *declared* gross calorific value of the gas per cubic foot. (The original proposal of the Fuel Research Board is modified by the introduction of the word "declared.") The calorific value of the gas is to be continuously measured and recorded. As regards the proportions of inert constituents allowable, the Board's original proposal was a maximum of 12 per cent., the gas companies claiming to be freed from any restrictions in this direction. The compromise now agreed upon states that the amount of inert constituents shall not exceed 20 per cent. for two years, 18 per cent. for the next two years, and 15 per cent. afterwards. The gas undertaking is to adjust, and if need be to replace gratis, the burners in consumers' appliances so that the gas delivered can be burned in these appliances with safety and efficiency. It will no doubt require some time for the consumer to become accustomed to these changes and to be educated up to grasp the meaning of the new unit, but, owing to the time required to make the new instruments and to adjust the consumer's appliances, it will probably be three or four years after the passing of the new Bill before gas is supplied over the whole country under the new conditions.

PROF. A. FOWLER, professor of astrophysics, Royal College of Science, South Kensington, has been awarded a gold medal by the National Academy of Sciences, Washington, in recognition of his eminent contributions to astronomical science.

PROF. A. W. CROSSLEY, professor of chemistry in the University of London (King's College), has been appointed director of research to the British Cotton Industry Research Association.

NOTICE is given that applications for grants from the Chemical Society Research Fund, made upon forms obtainable from the assistant secretary of the society, must be received on or before Monday, December 1 next.

THE Geological Survey of Great Britain and Museum of Practical Geology, Jermyn Street, S.W.1, have been transferred for administrative purposes from the Board of Education to the Department of Scientific and Industrial Research as from November 1. Correspondence with reference to the work of the Survey should be addressed as heretofore to the Director of the Survey and Museum, Jermyn Street, S.W.1.

AT a general meeting of the members of the Royal Institution, held on November 3, the special thanks of the members were returned to Mr. Richard Pearce for his donation of 100*l.* to the fund for the promotion of experimental research at low temperatures; to Mr. Robert Mond for his gift of laboratory material; and to Sir Humphry Davy Rolleston for his gift of a drawing of Sir Humphry Davy's birthplace and a water-colour of his statue in the Market Place, Penzance.

AT University College, London, on Tuesday, tablets in memory of Lord Lister were unveiled before a large and distinguished assembly. The Duke of Bedford, who opened the proceedings, said that every civilised community realised the debt of gratitude it owed to Lord Lister. Sir George Makins, president of the Royal College of Surgeons, unveiled the tablet to be erected in University College Hospital, and Sir Joseph Thomson, president of the Royal Society, that to be erected in University College.

AT the anniversary meeting of the Mineralogical Society, held on November 4, the following officers and members of council were elected:—*President:* Sir William P. Beale, Bart. *Vice-Presidents:* Prof. H. L. Bowman and Mr. A. Hutchinson. *Treasurer:* Dr. J. W. Evans. *General Secretary:* Dr. G. T. Prior. *Foreign Secretary:* Prof. W. W. Watts. *Editor of the Journal:* Mr. L. J. Spencer. *Ordinary Members of Council:* Mr. H. F. Collins, Mr. J. P. De Castro, Prof. H. Hilton, Mr. Arthur Russell, Dr. A. Holmes, Miss M. W. Porter, Mr. R. H. Rastall, Sir J. J. H. Teall, Mr. A. F. Hallimond, Dr. F. H. Hatch, Mr. J. A. Howe, and Mr. W. Campbell Smith.

THE meeting of the Physical Society of London on November 28 (at 5 p.m. in the Imperial College of Science, South Kensington) is to be devoted to a discussion of the subject of lubrication. The physical qualities of a good lubricant have for long eluded capture, and it is expected that the discussion will at least furnish a step towards the solution of the problem, and at the same time create a wider interest in the subject. Amongst those who will take part are the following:—L. Archbutt, R. Mountford Deeley, W. B. Hardy, secretary R.S., F. W. Lanchester, H. M. Martin, Principal Skinner, and Dr. T. E. Stanton. The meeting is an open one, and all who are interested in the subject are invited to attend.

DR. JOHN BROWNLEE has investigated statistically the periodicity of influenza epidemics. Considering specially the years 1889–96, he finds that the interval between the epidemics is thirty-three weeks, there being a missed epidemic when an epidemic is due in the autumn (*Lancet*, November 8, p. 856). With regard to the recent epidemics, from July 13, 1918, to March 1, 1919, the maximum points are separated by thirty-three weeks; from March 1 to October 1, 1919, is also thirty-three weeks. An epidemic is therefore due, but falls at an unsuitable season, and should therefore be small, and so far this is the case. On the same sequence the next epidemic should occur in January or February of the new year.

LORD MILNER, Secretary of State for the Colonies, has appointed a Committee to consider the position of the medical services of the various Colonies and Dependencies, with the view of maintaining and increasing the supply of candidates and of securing contentment within the service; and to consider whether the principle of assimilating the medical service of neighbouring Colonies may usefully be extended, and, if so, how far and by what means. The members of the Committee are:—Sir Walter Egerton, K.C.M.G. (chairman), Lt.-Col. Sir Harry Verney, Bart., Sir Humphry D. Rolleston, K.C.B., Sir W. B. Leishman, K.C.M.G., Lt.-Col. Sir James Kingston Fowler, K.C.V.O., Mr. T. Hood, Mr. A. Fiddian, and Mr. J. E. W. Flood (secretary).

AMONG the old mathematical worthies who are buried in the churches of the City of London is Nathaniel Torporley, who was interred in the church of St. Alphage, London Wall, now being demolished. Torporley, of whom there is a sketch in the Dictionary of National Biography, was born in 1564, the same year as Shakespeare. From the Shrewsbury Grammar School he passed to Oxford, graduating in 1584 from Christ Church and taking Holy Orders. It is said that for some years he resided in France and was amanuensis to François Vieta. After his return to England he became one of the pensioners of Henry Percy, the ninth Earl of Northumberland, and, like his contemporaries Harriott, Dee, Warner, and Allen, spent a part of his life at Sion College. Among his writings was one containing a rule for solving spherical triangles. Torporley died at Sion College, and was buried on April 17, 1632. The Church of St. Alphage was, we understand, destroyed in the Fire of London, 1666, but was afterwards rebuilt.

THE activities of the Royal Photographic Society naturally divide themselves into two sections, namely, the pictorial and generally illustrative and the scientific and technical. We are very pleased to see that a few of the more energetic members are taking the latter division in hand in order to develop it by extending its scope and encouraging scientific work. The "Scientific and Technical Group" consists already of 137 members of the society, and it is hoped that this number will soon be largely augmented. The members of the group pay a small additional subscription, the disposal of this fund being exclusively under the control of the administrative committee of the group. It is hoped to be able to distribute among the members abstracts or translations of scientific communications made to other societies or publications, as well as to arrange for scientific and technical lectures and papers. The Royal Photographic Society has always been the most important photographic centre in this country, and it is to be hoped that this new arrangement will be energetically pursued, and that it will lead to a greatly increased interest being taken in the science of photography.

THE annual council meeting of the National Union of Scientific Workers was held on Saturday, November 8, at the Imperial College Union, South Kensington, and was attended by delegates from nine branches. The chair was taken by the retiring president, Dr. O. L. Brady, and the chief business was the adoption of the annual report and of the rules, and the election of officers and executive committee for the ensuing year. Dr. J. W. Evans was elected president, Dr. Norman Campbell treasurer, and Mr. Eric Sinkinson secretary. At the dinner which followed, Dr. Evans, who presided, expressed the hope that the union, in company with such other bodies as the British Association and the British Science Guild, would do great things for science. Sir Ronald Ross, replying to the toast of "The Guests," thought there were three points for which the union might press:—(1) Better payment for newly qualified men, including the modification of the present system of research assistantships; (2) pensions on a transferable basis for staffs of universities and other institutions; and (3) payment for advice given to Government and municipal bodies, which frequently did not even give travelling allowances. The union should also press for public recognition and awards for inventions.

IN an able and very valuable summary of the mammals in the Melbourne Zoological Park, Dr. W. H. D. Le Souef, the director, contrives to give a lively description of all the more important indigenous mammals of Australia. As might have been expected, he adds some very interesting facts to what is known of the life-histories of these animals. Throughout he is constantly insisting on the need for legislation to stay the work of the exterminator. Over vast tracts of country some species have become absolutely wiped out. It is not a little disconcerting indeed to learn that the skins of wallabies and kangaroos are exported by the hundred thousand, for this means that vested interests are sure to beget strenuous opposition to the proposal which has been made to frame protective measures to secure the survival of at least a remnant of this remarkable fauna. But we trust this legislation will be speedily effected, or it will come too late. An additional toll upon this fauna is levied by the dogs, foxes, and cats which have been introduced by settlers, and in many cases have become feral. This memoir, which is illustrated by a number of very beautiful photographs, is issued by the New York Zoological Society.

THE *Journal of Indian Botany*, the first number of which appeared in September, has been started under the editorship of Mr. P. F. Fyson, of the Presidency College, Madras, to provide a means of publishing botanical work done in India which would not naturally find a home in the existing botanical journals of that country. In addition to original papers it is proposed to publish abstracts and reviews of papers which appear in other journals. The editor appeals for help to Indian botanists to make the journal, which will appear monthly, a success. The present issue contains a short paper by L. A. Kenoyer on the dimorphic female flower of *Acalypha indica*, a common tropical weed belonging to the family Euphorbiaceæ, which grows over most of India as a weed on waste ground. The lateral female flowers resemble those of Ricinus (Castor Oil) and the Euphorbiaceæ generally, but the terminal flower of the spike has one in place of three carpels, and develops one seed, which also differs slightly in size and structure from the normal seed. S. L. Ghose gives a systematic account of the Myxophyceæ, or blue-green algæ of Lahore, which occur throughout the year in drains and watercourses, artificial tanks, ditches, and on moist ground and tree-trunks. The study of this group has hitherto been neglected in

India. The author describes about twenty species which occur commonly, and others are occasionally met with. L. J. Sedgwick discusses the distinguishing features of some closely allied species of the genus Alysicarpus (Leguminosæ); and P. F. Fyson and M. Balasubrahmanyam describe the growth and root-structure of the strand-grass, *Spinifex squarrosus*, as a factor in the marine strand vegetation of Madras.

The recent work of the French in Morocco under the direction of Gen. Lyautey is described in detail by M. A. de Tarde in a well-illustrated article in the *Geographical Review* for July (vol. viii., No. 1). Gen. Lyautey has not stayed his hand during the war, but has continued a policy of reconstruction on a bold scale, building roads, railways, and harbours, improving agriculture, and multiplying schools, hospitals, and administrative buildings. The growth of European population in the larger town is not to be allowed to crush the native town, nor is the European quarter to form part of the old town. All European towns are to be separated from native towns by a strip of ground, on which no building is allowed. The task of planning the European towns has been entrusted to competent architects and engineers under the direction of M. Prost, who recently drew up plans for the extension of Antwerp. The plans for Casablanca, the chief port, Rabat, Fez, Marrakesh, and Meknes are now complete.

At the first meeting of the new session of the Institution of Petroleum Technologists, held on October 21, a paper was read by Mr. A. Philip on "Some Laboratory Tests on Mineral Oils." The author referred at length to the imminent need for the standardisation of tests and methods in petroleum analysis, and considered that it would not be feasible to prepare and circulate standard material of known composition. He therefore urged the very detailed description of procedure, so that it would be possible for a reasonably accurate repetition of results to be obtained from chemists working in different laboratories. The sampling of oils was described minutely as practised at Portsmouth, and great emphasis was laid on this all-important preliminary operation. The author then dealt with the distillation of crude oils, and described a novel experimental still of very considerable merit and ingenuity, designed to minimise the time occupied in the determination of the light oils and water-content of a given material. Tabular matter illustrated the application of the method, and results were given of the analysis of the Hardstoft oil. Methods of determining the vapour pressure of petrol, calorific value, moisture, and flash-point were criticised, and the procedure adopted in the lecturer's laboratory was detailed. It was shown that the flash-point of a fuel oil was liable to an experimental error of nearly 5 per cent., whilst if the oil was wet the discrepancies were very much more serious. In consequence a considerable tolerance should be allowed in specifications. A discussion followed, in which Sir Thomas Holland, Prof. Brame, and Dr. Ormandy made reference to the subject of standardisation, whilst Dr. Dunstan, Mr. Mitchell, and Mr. Lomax brought forward criticisms of the various methods detailed in the paper.

The *Engineer* for October 24 contains a description of the recently completed undertaking for the supply of water to Greater Winnipeg. The quantity rendered available amounts to 85,000,000 gallons per day, which should suffice for the needs of the city for some time to come, as the present number of inhabitants is only some quarter of a million, and the consumption 44 gallons per head per day. The water is obtained from Shoal Lake, with an area of 107 square miles, and a catchment basin of 360 square miles, which is connected with the larger expanse of 1400 square miles known as the Lake of the Woods. It is described as soft and excellent in quality; the chlorine content is three parts per million. The distance conveyed is 96½ miles. Of this 77½ miles is cut-and-cover work, with culverts varying from 10 ft. 9 in. by 9 ft. to 6 ft. 5 in. by 5 ft. 5 in. There are 7 miles of river siphons and 9½ miles of reinforced concrete pressure pipe. The distributing mains in the city of Winnipeg consist of 2⅓ miles of 48-in. concrete pipe. The work was commenced in 1913, and estimated to cost just above 2,600,000*l.*

Mr. F. W. Clifford, librarian to the Chemical Society, contributes to the *Library Association Record* for August an article on "The Library of the Chemical Society: A Record of a Recent Attempt at Co-operation." The Chemical Society has always aimed at including in its library every book and periodical that might help its fellows in their work. During the war this library has been of the greatest assistance to the nation, since it was found to contain most of the important works of foreign origin which Government Departments and manufacturers wished to consult. This increased use of the books impressed upon the library committee the importance of further extension in the technical direction. The council therefore invited a number of kindred societies to co-operate with it in extending the technical equipment of the library by appointing representatives on the library committee and by giving financial assistance for the purchase of books. The members of the societies thus co-operating are able to use the library on the same terms as fellows. The invitation has been accepted by the Association of British Chemical Manufacturers, the Biochemical Society, the Faraday Society, the Institute of Chemistry, the Society of Chemical Industry, the Society of Dyers and Colourists, and the Society of Public Analysts. This form of co-operation might perhaps be adopted with advantage by other libraries devoted to special branches of knowledge.

Messrs. George Bell and Sons, Ltd., announce:—"The Physiology of Vision: With Special Reference to Colour-blindness," Dr. F. W. Edridge-Green; "Practical Biological Chemistry," Bertrand and Thomas, translated by Capt. H. A. Colwell; "An Introduction to the Study of Vector Analysis," Prof. C. E. Weatherburn; "Nomography," Dr. S. Brodetsky; "Differential Equations and their Applications," Dr. H. Pioggio; and "Intermediate Chemistry," Prof. A. Smith. The same publishers have in preparation "Recent Investigations in Fluorescence and Related Phenomena," Prof. R. W. Wood; "A Text-book of Zoology," Prof. C. H. O'Donoghue; and "Physics: An Intermediate Course," Dr. A. O. Rankine. *Messrs. J. M. Dent and Sons, Ltd.*, are about to publish a portfolio of twenty-four coloured "Nature Studies" by E. J. Detmold. The issue will be limited to 500 sets, each of which will be numbered and accompanied by a certificate signed by the artist. *Messrs. Longmans and Co.* have in the press for appearance next year vol. i. of the treatise on "Higher Inorganic and Theoretical Chemistry," in six volumes, upon which Dr. J. W. Mellor has been working for the past twelve years. They also announce "A Manual of Practical Anatomy," 3 vols. (vol. i., The Extremities; vol. ii., The Head and Neck; and vol. iii., The Thorax and Abdomen), Prof. T. Walmsley; "Structural Steelwork," E. G. Beck; "A First-Year Physics for Junior Technical Schools," G. W. Farmer; and "Life in Early Britain: A Survey of the Social and Economic Development of the People of England from Earliest Times to the Norman Conquest," N. Ault. The new list of *Messrs. George Routledge and Sons, Ltd., and Kegan Paul and Co., Ltd.*, includes:—"The Social Maladies: Tuberculosis, Syphilis, Alcoholism, Sterility," Dr. J. Héricourt, translated, with a final chapter, by B. Miall; "Agriculture and the Farming Business," O. H. Benson and G. H. Betts; "Wonders of Insect Life," J. H. Crabtree; "Germination," A. E. Baines; and "Bakery Machinery," A. W. Mathys; "The Clay-working Industries," A. B. Searle; "Direct-current Dynamos and Motors," Prof. W. B. Griffith; "Electric Cooking and Heating," W. A. Gillott; "Engineering Instruments and Meters," E. A. Griffiths; "Manufacture and Installation of Electric Cables," C. J. Beaver; "Reproduction and Utilisation of Sound," H. O. Merriman; "The Turbo-Alternator," Dr. S. F. Barclay; and "The Utilisation of Natural Powers," E. L. Burne (in Routledge's Industrial Supremacy Books).

ARRANGEMENTS have been completed for the amalgamation of the business carried on by Mr. Robt. W. Paul at New Southgate, London, with the Cambridge Scientific Instrument Co., Ltd. Mr. Paul will join the board of directors, and the manufacture of instruments will be continued both at Cambridge and at New Southgate. On January 1, 1920, the name of the company will be altered to the Cambridge and Paul Instrument Co., Ltd., and as soon as possible the head office and showrooms will be transferred to London.

THE South-Eastern Union of Scientific Societies was established in 1896, and includes more than seventy affiliated societies. A correspondent writes to point out that the union was omitted from the list given last week. The list was not intended, however, to include unions or federations of societies, but rather individual societies which meet periodically throughout the year.

OUR ASTRONOMICAL COLUMN.

THE LEONID METEORS.—Though no special display of these objects is to be expected this year, the sky should be vigilantly watched on the nights from November 13 to 16, and particularly during the hours following midnight. The moon will be at the last quarter on November 14, being visible in the morning hours, but her light will be feeble and cannot materially interfere with the aspect of the shower. The radiant point in Leo does not rise until about 10.20 p.m. If any of the usual bright, streaking meteors are observed from this system, their apparent paths amongst the stars should be carefully recorded. There is no doubt, from the observations obtained in past years, that the stream of November Leonids is continuous in all sections of the orbit, and that there are considerable differences in the apparent strength of the shower witnessed from year to year. The maximum may be expected on the morning of November 15 or 16.

The shower of meteors connected with Biela's comet is due to return a few nights later than the Leonids, and, as the moon will then have waned to the crescent shape, observations may be favourably made should the atmosphere be suitable and free from the clouds and fogs so common to our climate at this season of the year.

THE GROUP OF HELIUM STARS IN ORION.—There has for long been a natural curiosity to find the distance of the great nebula in Orion. The problem became more hopeful when it was found that the group of helium stars was probably connected with the nebula, as appeared both by their configuration and by identity of radial motion (about +22 km./sec.). Dr. Bergstrand, of Upsala, has published (Nova Acta Reg. Soc. Scient. Upsal., ser. iv., vol. v., No. 2) an attempt to find this distance. First, he made a careful re-examination of proper motions in order to find the rate of closing in on δ Orionis, owing to increasing distance from us; he found for the parallax 0·0044″, with probable error 0·0049″. The second method was based on the assumption that the scattering of individual proper motions is comparable with that of the radial velocities; he thus obtained 0·0076″, with probable error less than 0·002″. It will be seen that the two determinations are of the same order of magnitude, and are also comparable with some other values; thus Dr. Charlier, in his memoir on the B stars, gave figures for the Orion group of which the mean is 0·0118″, and Prof. Kapteyn by another method found 0·0058″. Also four of the stars are binaries, and the mean of their hypothetical parallaxes, as given by Messrs. Hertzsprung and Stebbins, is 0·0078″.

From the large area that the group covers in the sky there is reason to expect a corresponding range in the individual distances. Hence we may look on the various determinations as satisfactorily accordant, and conclude that in putting the distance of the nebula as 400 light-years we are not very far from the truth.

THE SECULAR ACCELERATION OF THE MOON.—In a recent paper Mr. Nevill claimed to have shown that the observations of the last three centuries prove that the acceleration does not differ from its theoretical value. Prof. E. W. Brown, in the Proceedings of the Royal Society (Series A, vol. xcvi.), shows that, by making suitable changes in initial longitude and mean motion, a change as great as 5·4″ in the acceleration will make changes in the longitude that are less than 1·6″ for the whole interval between 1620 and 1950. Quantities so small as this cannot be evaluated from the observations, so long as the large inequality with period of the order of three centuries remains unexplained by theory. Hence, apparently, the ancient eclipses, unsatisfactory as the records of them are, supply the only material available for determination of the acceleration.

THE GLASS RESEARCH ASSOCIATION.

IT is now widely known that among the industries which have been profoundly influenced by the war the glass and glassware industry of the United Kingdom occupies a foremost place. Not only have the pre-war products of this industry, as they existed in this country before the war, been found essential for a wide range of national purposes during wartime, but the necessity has also been forcibly realised of creating certain special sections of this industry, previously non-existent in the country, to supply glass and glassware, glass instruments, and glass apparatus directly necessary for the prosecution of the war, as well as similar articles equally vital as being indispensable for the efficient operation of other industries. The importance of the glass industry to the economic life of the nation is to be measured largely by its effect upon, and indispensability to, other industries. This has been fully recognised by the Government in the inclusion of scientific glassware and illuminating glassware, as well as optical glass, in the schedule of unstable "key" industries.

But the revolutionising effect of the war upon the glass industry is not alone manifest in the creation of these "key" sections which previously were monopolised by Germany and Austria, whose glass manufacturers had attained great strength and reputation,